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VOL. XXIX, No. 26. DECEMBER 22, 1932

THE JOURNAL OF PHILOSOPHY

THE EARLY DRAFT OF LOCKE'S ESSAY[1]

A STRIKING contrast may be drawn between Locke's original intent in discussing human knowledge and the finished *Essay* that finally came from his pen in 1690. On the one hand Locke set out to state in brief compass the few clear principles which he thought went to make up a sound methodology for intellectual enterprises. He was obviously impressed and deeply influenced by the work of the men who constituted the Royal Society or were carrying on scientific investigations into many matters of what was in the seventeenth century called "natural philosophy." He wished to extend the same procedure to the more troubled fields of "morality and revealed religion," of politics and economics and social life. He wanted to restrain men from wasting their time in speculations about what they could never really know and to direct them to wise investigations of practical affairs. He was certainly no ordinary rationalist; for he firmly maintained that all ideas are derived from experience. But he also, contrary to common classification, was no wholehearted empiricist; for he trusted the innate faculty of reason to proceed to operate as freely as it chose upon the ideas thus derived: he sought to make men aware of just what their reason was engaged in doing, but made reason, thus enlightened, "our last judge and guide in everything" (*Essay*, Book IV, chapter 19, section 14). His methodological principles, stripped of the technical accretions in which they were embedded in the *Essay*, were that we should learn docilely from experience, that we should restrain our enthusiasms and passions, that we should distinguish between knowledge of things and knowledge of modes of our own intellectual constructions, that we should be reasonable, that we should not mistake opinion for genuine intuition or demonstration.

On the other hand he finally published an *Essay* of over four hundred folio pages in which he expressed views on dozens of subjects that were characteristic themes of philosophical controversy at the time he was writing. Some of these themes were personal identity, mathematical certainty, arguments for the existence of God, the proper relation of reason and faith, the association of ideas, the

[1] *An Essay concerning the Understanding, Knowledge, Opinion, and Assent.* John Locke. Edited with an introduction by Benjamin Rand. Cambridge: Harvard University Press. 1931. lx + 307 pp.

passions of the soul, the nature of substance (material and spiritual), degrees of knowledge, substance and essence, the logical status of "first principles," primary and secondary qualities, cause and effect, infinity, liberty and necessity, the relation of understanding and will, the springs of action in human beings. Thus the *Essay* gradually became in Locke's hands much more than a brief statement of the methodology for successful thinking. It became a commentary on many phases of the intellectual life of the century at the end of which it finally appeared.

The contrast between Locke's simple intent and his elaborate achievement is striking. It might give rise to different kinds of treatment. We might ask what it has meant for the subsequent history of ideas. It has meant, among other things, the tying up of the methodological appeal to experience with a conception of experience as a kind of subject-matter, the formation of a "school of empiricism" that has rather exploited the conception of experience than practised an empirical methodology, the commitment of "empiricism" throughout modern times to a dwelling on certain "persistent problems" that form a large part of the controversial material of philosophical discourse. But this line of inquiry would carry us away from Locke himself and has in any case been frequently, and more or less adequately, pursued. We might better ask here what the contrast between Locke's intent and achievement indicates concerning the course of his own intellectual development. Especially should we attempt this latter task because of the new material we now have at our disposal as the result of the publication under the editorship of Dr. Benjamin Rand of Locke's earliest important written discussion of problems of human knowledge. Locke entitled this early writing *An Essay concerning the Understanding, Knowledge, Opinion, and Assent,* and dated the manuscript in his own handwriting 1671.[2] This new material for a study of the development of Locke's

[2] Harvard University Press, 1931. The publication of this manuscript will probably serve to settle one point that a prior volume of source material for Locke under Dr. Rand's editorship threatened to render controversial. This point is the date at which Locke's friends met in his chambers on the occasion which is described in the famous passage in *The Epistle to the Reader* in the *Essay.* For many years historians had been prone to accept the date of 1670–1671 for that meeting. They did so largely on the basis of LeClerc's biography of Locke which said: "In the year 1670, and 1671, Mr. Locke began his *Essay concerning Humane Understanding,* at the earnest request of Mr. Tyrrell, and Mr. Thomas and some others of his friends, who met sometimes in his chamber to converse together, as he himself hath told me" (cf. *The Life and Character of Mr. John Locke,* 1700, p. 8). This statement was based on information sent to LeClerc by Lady Masham, who had gathered much biographical material directly from Locke's own lips (cf. H. R. Fox Bourne, *The Life of John Locke,* vol. I, p. 248, footnote 2). It was confirmed by Lord King's remark that the original copy of the *Essay* was dated 1671 in Locke's own handwriting (*The*

thought is invaluable. We have now the first draft of what, rewritten "by incoherent parcels" and greatly enlarged, became the *Essay*.

In studying the relation of the draft to the finished *Essay* we should note first the differences of content of the two writings. The draft contains four pages that Locke incorporated in his *Introduction* to the *Essay* (often printed as chapter 1 of Book I), forty-two pages that went into the remaining chapters of Book I, one hundred and fifty-three pages that went into Book II, sixty-five pages that went into Book III, and twenty-nine pages that went into Book IV. Often whole pages of the draft were embodied with only slight verbal changes in the *Essay;* sometimes the revision of the draft was so extensive as to amount to practically fresh material. The subjects treated in the draft and corresponding passages in the *Essay* were the futility of appeal to innate ideas and principles, the origin of all ideas in experience, the distinction between sensation and reflection as two kinds of experience, the development of complex ideas from simple ideas by activity of the mind in sorting and arranging and combining simple ideas, the use and danger of general terms, imperfections and abuse of language, the need of guarding against the error of taking all words to stand for real things, the superiority of present sense-experience to memories of past sense-experience, the impossibility of knowing what lies beyond experience, and arguments for the existence of God. Most of these subjects are fairly closely related to Locke's intent to formulate a methodology for intellectual enterprises; even the arguments for the existence of God can be

Life of John Locke, 1829, p. 6), and that the *Essay* was "first sketched out" in 1670 (*ibid.*, p. 32). James Tyrrell put the date down as 1673; but he made this statement in the margin of his copy of the first edition of the *Essay* that appeared years later (which copy is to-day in the British Museum). When Dr. Rand brought out *The Correspondence of John Locke and Edward Clarke* in 1927 he printed a letter written by Locke on December 31, 1686, in which Locke spoke of having been studying problems of knowledge for "five or six years" (p. 177); and he inferred from this passage that the famous meeting in Locke's chambers did not occur until 1681 or 1682 (p. 28). Dr. Rand thus threw doubt on the reliability of the accepted view, and he does not refer in his new volume to his former contention for the late date. Yet he has evidently returned to the accepted view. For he prints a photograph of the sheets on which Locke dated his draft for the *Essay* 1671; and the draft of the *Essay* which he now publishes contains three passages in which the phrase "this present year 1671" or its equivalent occurs (pp. 255, 256, 261). We thus have the best evidence we could wish for the date of 1671 as the date of the elaborate draft which Locke used as the basis of his writing of the *Essay*. And since Locke explicitly denied (cf. *The Epistle to the Reader* in the *Essay*) that he had written systematically on problems of knowledge prior to the meeting of friends in his chambers, we can not plausibly doubt that the meeting of friends was earlier in 1671 or even in 1670. Thus LeClerc's statement is amply justified, and the problem of the date for the inception of the *Essay* is pretty well solved.

taken as an illustration of how the methodology leads to constructive results.[3]

With that list of subjects it is instructive to compare the list of new topics that Locke did not deal with in 1671 but included in the *Essay* itself. While some of the new material of the *Essay* is but an expansion of what he had said in the draft, a great deal of it is devoted to novel themes. The *Essay* discusses the following new topics: a refutation of Descartes's doctrines that thinking constitutes the essence of soul and extension the essence of body; a definition of some of the passions in a fashion closely akin (but much inferior) to Descartes's; a treatment of the mental powers of brutes that is quite at variance with Descartes's theory that brutes are automata; a restatement of Descartes's distinction between primary and secondary qualities, though in a variant form; a theory of personal identity that is based on a recognition that we can never know the real substance of the soul; a generalized confession that our human faculties are not fitted to give us "a perfect, clear, and adequate knowledge" of substances; an elaborate discussion of our ideas of substances which, though useful to guide practice, are all of them false "when looked upon as representation of the unknown essences of things"; an important distinction between real essence and nominal essence; and a consequent acknowledgment (reluctantly made) that "men can have no ideas of real essence" because "as to real essences of substances, we only suppose their being, without precisely knowing what they are." Furthermore this list should contain practically all the topics of Book IV save the arguments for the existence of God. It should contain the famous definition of knowledge; the distinction between kinds of knowledge and between degrees of knowledge; the endeavor to find a logical basis for knowledge of "real existence" which would prevent the conclusion that "our most serious thoughts will be of little more use than the reveries of a crazy brain"; a hesitant treatment of "sensitive knowledge" which is finally denied to be properly called knowledge and is put down as a matter of "judgment" or probability; and a sceptical conclusion that, however far experimental work may advance useful philosophy, no "science of bodies" is "within our reach." The sceptical conclusion is not consistently maintained. It evidently distressed Locke but was required by a candid handling of the course of the argument.

In studying the relation of the early draft to the finished *Essay* we should next note certain differences in phraseology in passages

[3] If the arguments for the existence of God are so taken, we have a clear proof that Locke never intended to advocate the merely-empirical method which some historians attribute to him. Rather we find that Locke maintained that the materials for reflection come from experience, and knowledge results from the skillful exercise of reason upon these materials.

that are substantially equivalent in most respects. Many changes in phraseology were doubtless made for literary reasons: happier illustrations were sometimes substituted for less happy ones, and intimate colloquialisms suited to the little group of friends in Locke's private chambers gave place to more dignified prose. But that is by no means all that the attentive reader of draft and *Essay* will note. There is a whole series of changes that reflects a fundamental shift in metaphysical position. A simple but, I believe, a revealing instance of this series of changes occurs when the words "the specific nature" of objects (which occurred frequently in the draft) were deliberately abandoned in the finished *Essay* in favor of "the real essence" of objects. This change is found for instance in the passage in which Locke brought in the illustration of the strange bird in St. James's Park that he called *cassuaris*. The illustration is trivial; but the point it illustrates led Locke to make some important remarks. The point is that familiarity with the correct term to apply to the bird is not equivalent to knowledge of the nature of the bird. If I see a bird, to quote Locke's words, "about three or four feet high, with a covering of something between feathers and hair, of a dark brown color, without wings, but in the place thereof two or three little branches coming down like sprigs of Spanish broom, long great legs, with feet only of three claws, and without a tail,"—if I see such a bird and am informed that the bird is a cassuaris, I should not infer that I have come through possession of the name into knowledge of the entire nature of the bird. Gaining a word leaves me with only so much knowledge of the bird as I had before I gained the word. I may acquire a scientific vocabulary and yet know nothing of what the vocabulary indicates to more trained and tutored minds. In the language of the draft, I know "no more of the specific nature or constitution of that sort of animal than I did before" (p. 154). In the language of the *Essay,* I know "no more of the real essence or constitution of that sort of animals than I did before" (Book III, chapter 6, section 34). And in those two slightly different phrases lies a vast difference in metaphysical viewpoint. In the first phrase the implication is that I do not gain sufficient information about the nature of anything through a first glance at it; that I need more investigation, experimentation, study; that I may have to employ such methods as dissection; that I need wide experience of other things of related species. Yet the implication is further that experience can lead me on to an adequate knowledge of the specific nature of the thing in all its rich variety of qualities and in all its relations to other things. In the second phrase the implication is different. Experience can tell me more and more of what the thing will appear to me to be, but can never disclose what the thing really is in its own nature. The real essence lies beyond the range of any

possible experience however vast. In the draft Locke contrasted partial or superficial experience with fuller or reflectively controlled experience. In the *Essay* he contrasted appearance inside experience with existence in fact. In both writings the term "experience" is highly equivocal. Yet in the draft, it is always, whatever else it may be, a method of coming into contact with real things. And while it remains such a method in the *Essay* (particularly in passages that follow closely the language of the draft), it also becomes at other times (particularly in passages that are additions to or extensive corrections of the draft) a kind of obstacle to even a theoretically possible direct contact with things.

The same antithesis between standpoints of draft and *Essay* is apparent elsewhere. For example, consider the term "idea." In the draft idea is often almost synonymous with quality. Ideas are said to be in things: they are those qualities of things that are observed. Qualities, in becoming ideas, do not cease to be qualities. So Locke wrote of the "common collection of simple ideas that are constantly found together in many particular things" (p. 155). And though such phrases sometimes get over into the finished *Essay* (cf., e.g., Book II, chapter 23, section 1, which is word for word parallel to a passage on page 120 of the draft), yet the *Essay* avoids them at most points. The more a reader goes on towards Book IV (which is almost wholly new material that was not in the draft), the more ideas become mental states that do not resemble qualities of objects. Thus Locke's scepticism grew. Locke frankly stated in the *Essay* that the collection of simple ideas that experience leads us to regard as belonging together constitute at best but the "nominal essence" of things; and though Locke tried to console himself by thinking that the nominal essence is quite as useful for a guidance of affairs as knowledge of the real essence would be, he is not happy in his conclusion.

Similarly is it with a slight change of phraseology that occurs in the discussion of the existence of God. In the draft Locke wrote that of God's existence "we have a more certain knowledge than anything which our senses have not immediately discovered to us." Or: "His existence is that which we are capable . . . of being most certainly sure of next to our own; or, at least, next to the existence of those things which we have seen and felt ourselves" (pp. 206–207). But in the *Essay* he dropped this language. He was still certain of his own existence and of God's existence; but of the existence of other things he was so much less sure that he can not reinforce proofs of God by calling them as satisfactory as proofs of things present to sense. The "things which we have seen and felt ourselves" have given place to a vaguely conceived external cause of our sensations;

and even this vaguely conceived cause is postulated to exist as a thing the nature of which can never be known.

Again we find the same antithesis in phrases in which Locke announced the nature of the inquiry on which he was embarking. In the draft Locke wrote that he would not consider his time as misemployed if he succeeded in giving an account of the ways whereby "we come to attain the knowledge of things"; in the *Essay* he changed this to read that he would not consider his time misemployed if he gave an account of the ways whereby "our understandings come to attain those notions of things we have." Then on the next page of the draft he wrote that he would "endeavor to show what knowledge the understanding has by those ideas of the existence of things without us"; but in the *Essay* he omitted the last seven words of this sentence. (Cf. pp. 17 and 18 of the draft, and sections 2 and 3 of the Introduction to the *Essay*.) Again he wrote in the draft (p. 21) that he would show how we "come to knowledge of and certain assent to some general truths, resulting from the consideration of things themselves." But in the equivalent passage in the *Essay* he toned this statement down to the form that he hoped to show "how men may come to that universal agreement, in the things they do consent in" (Book I, chapter 1, section 3). In all these changes, slight in themselves, impressive in their cumulative effect, we find Locke moderating his original confidence in the value of his methodology for ontological purposes and confessing his dismay over the sceptical outcome of his premises. We have not so much knowledge as notions of things; we do not so much get knowledge of things without us as discover relations between our own ideas. Never did Locke in the *Essay* assert that we can hope to have "general truths, resulting from the consideration of things themselves." Rather he said that "general certainty is never to be found but in our ideas," and that "all general knowledge lies only in our own thoughts, and consists barely in the contemplation of our own abstract ideas." These last two phrases (quoted from Book IV, chapter 6, sections 16 and 13) are separated by thousands of words from the other phrases just quoted from opening pages of the *Essay*. But they present the logical implication of the theory of ideas as announced in the draft and retained in the *Essay*. And they betray that Locke's mature reflections had forced him to recognize the necessity of correcting the initial program he expressed in the draft and to restate his intent to conform to his performance. How could Locke retain the confident tone of the draft when, after many years of patient reconsideration of his theories, he had to confess that "we are so far from being admitted into the secrets of nature, that we scarce so much as ever approach the first entrance towards them" (Book IV, chapter 6, section 11)?

Even in his illustrative material Locke showed in the *Essay* a shift from the type of example he was prone to use in the draft. In attacking innate ideas, for example, Locke said that if men really did have innate ideas these ideas ought to shine out as brightly in their minds as—well, as anything at all of which they were entirely certain. And in the draft he put the point in the form that innate ideas, did they exist, would be as clear and certain as our knowledge "of the sun being risen at noonday." And when three pages further on he wished to give illustrations of propositions that everybody admits as soon as he hears them, he mentioned the propositions that "fire is hot, and ice harder than water" (pp. 50, 53). But in the *Essay* these illustrations are changed. He there wrote that innate ideas, did they exist, would be as bright in our minds as our "love of pleasure and abhorrence of pain"; and he listed as propositions which everybody would admit that "white is not black, a square is not a circle, bitterness is not sweetness" (Book I, chapter 1, sections 27 and 18). Even in such little matters as the illustrations suitable to his position we find that Locke had come to appreciate the sceptical force of his philosophical principles. He was no longer able on his own principles to be sure that the sun was risen at noonday, that fire is hot, or that ice is harder than water. He was now able to be sure only of subjective feelings like pleasure and pain, or of abstract ideas like square and circle, or of ideas of sensation like white and black.

So much, I think, the historian may say concerning the relation of the draft and the finished *Essay* in the matter of philosophical standpoint. If now one proceeds to seek an explanation of the intellectual forces that influenced Locke's gradual development, one enters more speculative territory. Yet the evidence is now sufficient, it seems to me, to re-emphasize and re-state that one potent influence upon Locke's entire intellectual history, from early manhood to closing years, was Cartesianism. Other influences, theoretical and practical, there of course were. But no single influence, I believe, was more potent and more persistent upon Locke's mind than Cartesianism. And since it has been traditional to oppose Descartes as a rationalist and Locke as an empiricist (thus obscuring the empirical elements in Descartes's method and the strong rationalistic elements in Locke, as well as suggesting that the later thinker worked in independence of the earlier), the degree of Cartesian influence upon Locke should be summarized again.

The truth of the matter seems to me to be this. Locke was indebted to Descartes in his student days for what seemed to him a satisfactory escape from decadent scholasticism and took over, with little criticism, certain of Descartes's principles and always retained them as fundamental in his own thinking. He then turned from the

study of technical philosophical writings and eagerly joined forces with that group of scientific workers who more or less consciously regarded themselves as "Cartesian" in spirit or as developing "the new philosophy" in opposition to "the old philosophy." And then finally, as he became aware of the inherent difficulties of the procedure and assumptions of "the new philosophy," he turned once more to the writings of Descartes for help, reread Descartes carefully, and defined his own position in precise opposition thereto. Even to the end, however, he was unable to criticise Descartes thoroughly enough to reach a position which would enable him to defend the ontological results of scientific research as well as to accept the methodology of scientific procedure.

This hypothesis concerning the degree to which Cartesianism contributed to Locke's intellectual development is complex. It must be considered in three steps. But at the outset it should be noted that Cartesianism is used not only for Descartes's own philosophical and scientific writings but also for the whole European movement of thought that took Descartes as its patron saint and dominating figure. At the time when Locke was a student at Oxford and again during the years when he was revising the draft and composing the *Essay* he read Descartes directly; but in the intervening years he was merely under the influence of the general Cartesian movement that swept over England as over the continent.

The first part of my hypothesis concerns Descartes's early influence on Locke. The evidence here comes from the year just after Locke's death but is, I think, quite reliable for a knowledge of Locke's student days at Oxford. Locke's friend Lady Masham (in whose home Locke spent his declining years and finally died) wrote to the Frenchman LeClerc all that she could remember of Locke's remarks on his own life, in order to help LeClerc compose his brief biography of Locke. Two of her sentences are here important. "I have often heard him say, in reference to his first years spent in the university, that he had so small satisfaction there from his studies, as finding very little light brought thereby to his understanding, that he became discontented with his manner of life."[4] Other remarks by Locke also show that he regarded the peripatetic philosophy taught at Oxford as utterly futile. But some one sent him to the works of Descartes; and in these works he found great delight. As Lady Masham wrote: "The first books, as Mr. Locke himself has told me, which gave him a relish of philosophical things, were those of Descartes. He was rejoiced in reading these, because, though he very often differed in opinion from this writer, he yet found that what he said was very intelligible; from whence he was encouraged to think

[4] Quoted from Fox Bourne's *The Life of John Locke*, Vol. I, p. 47.

that his not having understood others had possibly not proceeded from a defect in his understanding."[5] And when, just after his student days, Locke visited the continent and was taken to hear a debate by some scholastic monks on *materia prima*, he waxed very mirthful in writing home to a friend about the absurdities of the whole performance.[6] The logic-chopping and subtle distinctions of the peripatetics seemed to him quite without profit or instruction. Descartes by comparison seemed not only clear, but concerned with real issues and productive of genuine knowledge. Locke never classified himself as a follower of Descartes: indeed he expressly asserted in later years that though he "must always acknowledge to that admired gentleman the great obligation of my first deliverance from the unintelligible way of talking of the philosophy in use in the schools in his time," yet he could not properly speak of himself "as the scholar of so great master."[7] Locke's indebtedness to Descartes was perhaps greater than he realized. It was, as he said, for emancipation from scholasticism, encouragement to trust his own powers, and general intellectual stimulus. But it was also probably for the conviction that we should find the seat of certainty in our own ideas rather than in what we take to be things. For while Locke did not use this theory in the dramatic and almost ironical way in which Descartes used it in his *Meditations* as a kind of metaphysical fulcrum, he accepted it wholeheartedly and never ceased to put it down as a central tenet of his thinking. That we should, indeed that we must, begin with our own ideas as the most certain fact we have for philosophical assurance was a useful means with which to combat the various dogmatisms that disturbed seventeenth-century England with their cries of infallibility. So useful a principle Locke would easily take over from the admired author. So it is not surprising to find that among the earliest jottings in Locke's note-books he said that we must begin our search for knowledge with our own ideas. That Locke is directly indebted to his reading of Descartes for this principle can hardly be proved, because he could have gained it from other sources in a century when it was widely professed. But that he so gained it is not improbable; and if he did gain it from other sources, the other sources were quite probably under Cartesian influence.

The second part of my hypothesis is that Locke, though not continuing the study of Descartes so far as evidence is available, moved for most of his life in what we may fairly describe as Cartesian circles. Descartes had been cordially hailed in England as a symbol of "the new philosophy." Whoever was not a peripatetic was of necessity

[5] *Ibid.*, p. 62.

[6] *Cf.* Lord King's *The Life of John Locke*, 1829, p. 20.

[7] Locke's first letter to Stillingfleet, Bishop of Worcester, 1697, p. 103.

a Cartesian. The issue between "the old philosophy" and "the new philosophy" was drawn with absurd sharpness, as if there were no middle ground or further alternative. To be a Cartesian was not to accept, it was not even to know, all of Descartes's philosophical principles: indeed many who used the name of Descartes as a kind of rallying cry against "obscurantism" read Descartes little or carelessly. To be a Cartesian was rather to desire the spread of experimental science. Summaries of scientific knowledge, like the amusingly amateur works of the Duchess of Newcastle or the more respectable works of Anthony LeGrand, show what in Descartes appealed to many English minds. But with the endorsement of Descartes's contribution to science went many a trace of his more general philosophical principles, notably the dualism of material bodies outside the mind and ideas inside the mind. Indeed most of the scientific movement in seventeenth-century England echoed recurrently the epistemological and metaphysical dualism to which Descartes had given such competent and searching consideration. Leaders of thought at Cambridge and sometimes at the more conservative Oxford and provincial universities joined with workers in the Royal Society and elsewhere to proclaim admiration for Descartes. Henry More, Joseph Glanvill, Simon Patrick, even Cudworth, spoke forcefully for Descartes as the hope of enlightened scientific work and clear thinking. Praise of Descartes became quite rapturous, so extravagantly rapturous that it led to a reaction which, particularly after Sir Isaac Newton, was unduly severe. During the years when Locke acquired interest in methodological problems and drew up the draft of the *Essay* and began to revise the draft, Cartesianism was the progressive and hopeful force for those who were discontented with trivialities and futilities of decadent scholasticism. Though we have no means of measuring the extent of Locke's recognition of Descartes's rôle in this general Cartesian movement,—though Locke never joined in the rapturous praise or the later slurring disregard of Descartes,—he belonged in sympathy and profession to the movement that called itself after Descartes.

Then the third part of my hypothesis is that Locke once again became a reader of Descartes's works and a thoughtful critic of Cartesianism during the last years before he brought the *Essay* to completion and published it in 1690. I conjecture that his return to Descartes's works was due to his growing realization of the implicit contradictions and sceptical implications of the Cartesian methodology and his own initial statement of that methodology. I make this conjecture because such a realization on Locke's part would lead him to seek help once more in the same writings from which he originally derived inspiration and to which he could not help but know the whole scientific movement owed the most competent statement of

many of its presuppositions. Locke can fairly be said to be the first Englishman whose writings made clear that the theoretical defences of current scientific method and practice contained elements that undermined the ground which these defences sought to protect. Whatever the motive, however, the fact that Locke reread Descartes between 1671 and 1690 can not be doubted. Internal evidence is abundant in the elaborate refutations or qualified acceptances (listed above) which Locke gave to several leading doctrines of Descartes. Thus Locke added to his growing mass of material that became the *Essay* a searching criticism of Descartes on many important points. Evidently, if he had turned back to Descartes for help, he found none there. The man whose writings had stirred him as an undergraduate did not solve the perplexities of his more mature years. If Locke could have agreed with Descartes that whatever we clearly and distinctly conceive is true, he might have made of his *Essay* a consistent dualistic treatise. But Locke was too honest an observer of scientific procedure to defend scientific conclusions on such a ground. And when he rejected this contention by Descartes, the theory of knowledge which he had built up on the basis of suggestions he took from Cartesianism and his own observations of science-at-work broke down into a metaphysical scepticism. That Locke came at last to confess that "no science of bodies" is possible is better evidence of the moral and intellectual candor of the man than of the accuracy of his premises to the facts of scientific experience. Locke's *Essay,* in its successive forms, may therefore be said to indicate both Locke's allegiance to certain Cartesian premises and his final recognition that the Cartesian movement was unable to justify its ontological confidence.

Locke's *Essay* is the most important commentary on Descartes that has ever come from England. The dualism implicit in the draft is exposed in all its implications in the developed *Essay.* This dualism was irrelevant to Locke's intent in writing on problems of knowledge; and once it became his premise, it defeated the realization of his intent. Thus aside from the fact that Locke came to discuss in the completed *Essay* many themes of interest and of controversy in philosophical literature of his time, he gave a review of the merits of Descartes's central philosophical doctrines. The *Essay* became historically the occasion which led subsequent speculations into idealisms, phenomenalisms, subjectivisms, and other -isms which Locke would himself have condemned as new forms of enthusiasm. But taken in itself, the *Essay* is much less of an announcement of future lines of speculation than it is an estimate of the chief intellectual forces in the decades before it appeared.

Too much importance can hardly be assigned, I believe, to the fact that there is almost nothing of the material of Book IV of the

Essay in the early draft (except the arguments for the existence of God which, occurring as they do in Book IV, are yet in tone of assurance utterly different from the tenor of the rest of the Book). In the draft Locke was primarily concerned to stress the doctrine that all the materials for thinking come from experience. But by accident of his historical situation and personal tastes he defined experience as a subject-matter which has a psychological and hence a subjective status. Therefore he came more and more to realize that knowledge, even if it occurs often enough in human life, is for his philosophical standpoint an inexplicable problem. We may put the contrast between draft and *Essay* in several ways. Whereas the draft took more or less for granted that we could get knowledge easily enough if we once got started in the right way, the *Essay* concludes that we can not possibly get any knowledge of nature because of the way in which we have to start. Or, whereas Locke adopted eagerly the methodology of natural science in order to introduce discipline and caution and reserve in matters of theology and politics and social questions, he ended by seeing that the method which would properly restrain men from dogmatism and enthusiasm in theology and politics and social questions would also prevent them from taking the results of natural science ontologically. Or, he strove to adopt the method of natural science for the profit of other affairs; and then generalizing it, he found it collapse in his hands. Doubtless he was happy to find a cure for dogmatism and doctrinaire extravagance; but he was clearly most unhappy to pay as price for this cure a loss of confidence in the conclusions of natural science. A measured scepticism he desired; an unmitigated scepticism he was reluctantly forced to grant. And in whatever way we happen to express this contrast between early draft and finished *Essay* we see that an ironic turn overtakes the history of the development of Locke's thinking. This ironic turn is of significance for the intellectual biography of one of the great thinkers of modern times; it is also of significance as commentary on the hopes and confusions of the great century of which his *Essay* is a major interpretation.

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REFLECTIONS ON INFINITY

IN this paper I intend (1) to discuss certain familiar difficulties in the traditional notion of infinity; (2) to give a modified interpretation of it, as following from the findings; and (3) to show that there are no real infinite magnitudes.

It is generally assumed that infinite numbers, if they exist at all, necessarily belong to the arithmetical series. On the other hand, since Kant wrote his famous first antinomy of pure reason, most thinkers concede that infinity can not be reached through the ordinal sequence originating in the first integer; they contend—or, at least, do not see how it can be otherwise—that the natural sequence starting with 1, 2, 3 . . . leads to no infinite number, no matter how long we continue the counting. However, it is obvious that the above statements are incompatible with each other. Indeed, either infinite numbers do not belong to the ordinal series at all; or, finite numbers must suddenly pass, at some moment of counting, into what Cantor called transfinite numbers. But no mathematician will accept such a hocus-pocus without reluctance.

If we start our analysis from the other end, and attempt to descend from transfinite to finite numbers, we meet another set of difficulties. Finite numbers are characterized by the property of containing more terms than any of their parts. But, according to the cardinal definition of the infinite, "a system S is said to be *infinite* when it is similar (aehnlich) to a proper part of itself" (Dedekind, *Essays on the Theory of Number,* p. 63), or, as Russell says, parts of the infinite "have the same number of terms as itself" (*Principles of Mathematics,* I, 368). It follows that we may take one half of the infinite, divide it into as many portions as we please, subtract from it any finite terms, or add to it, multiply it, extract roots,—and still the infinite remains changeless. Why this should be so, is a mystery which few of us are inclined to question. In fact, there even are thinkers who pass into the offensive and, instead of trying to account for this most remarkable property of the infinite, state that the axiom, according to which the whole is greater than any of its parts, holds true for finite collections "precisely *because* they are finite" (Royce, "The Concept of the Infinite," *Hibbert Journal,* I).

The only ways to bridge finite and infinite numbers, in the view of mathematicians, are such as to take a finite number an infinite number of times; or, to divide an infinite system into an infinite number of parts. However, we should draw no hastily conceived conclusions from either of these operations, the more so as it is not easy to see how they are possible at all. For the first of them implies the assumption that infinite numbers belong to the arithmetical series and can, consequently, be taken—which has yet to be proved. I question our right to use the equation $n.I = I$, where I stands for the infinite. The second operation, expressed by the equation $I/I = n$, is evidently a mere transposition of terms, from which some of the mysterious characteristics of infinite numbers have, nevertheless, been inferred. Unless infinite numbers belong to the arithmetical series in every sense of the phrase and unless, consequently,

they can be reached through the ordinal sequence, the finite and the infinite remain disparate, and the operations created through the study of finite numbers are not applicable to infinite numbers; or, if they are, this has never yet been demonstrated. Mathematicians have, therefore, been consistent—but not necessarily right—insisting on the cardinal definition of an infinite system, as cited above, rather than on the ordinal definition of it. But they should have made one more step and announced that arithmetical operations do not modify infinite numbers, not because such is the property of infinites, but because such operations do not apply beyond the realm of the finite. Then they would not have allowed the regrettable mistake of accepting the two equations supposed to bridge the mutually exclusive systems. They would have said that nobody knows whether or not infinite numbers can be divided, multiplied, or suffer any other mathematical operation; and whether or not $n.I$ is an operation that makes sense.

However, there is even no need of assuming that infinite numbers are transcendent entities. Indeed, it is possible to ascribe to infinites, in general, a negative rather than a transcendent character, using the concept "in correlation and contrast to the finite" (Sir W. Hamilton, *Lectures on Logic,* p. 74). That the arithmetical series has no last number, or, as Royce put it, that no "finite series can exhaust the possible whole number," does not mean that such a series must contain infinite numbers. No matter how long we continue the counting, we meet finite numbers; and there is not a chance that we should thus reach the infinite. The series is endless, but it is neither infinite, nor containing infinite numbers. We do not know whether there are real endless continuities, such as the conceptual space and time are sometimes believed to be, but we are convinced that there are logical continuities, the arithmetical series being an example, which are endless; and, whereas endless physical continuities would almost necessarily imply real and positive infinites, logical endlessness may be purely negative.

Yet few thinkers would agree that infinites are merely negations. To say the least, infinitude is a negative characteristic applicable only to certain arithmetical series and expressing thus their distinction from other series, a distinction which is quite real. However, the nature of the infinites becomes considerably clearer if we regard them as members of the *algebraic* rather than of the *arithmetical* series. Algebra, as is well known, is a science dealing with operations upon mathematical symbols which are indefinites as long as they are not solved and thus transformed into definites. I think that it may be instructive to put algebraic symbols into the form of a series (including both the evanescent and growing sequences) which can be represented as follows: $\ldots 1/I \ldots 1/I,\ 1/I \ldots 1/z,\ 1/y,\ 1/x \ldots x,\ y,$

$z \ldots I$, $I \ldots I \ldots$ The symbols x, y, and z may be called *real indefinites*, that is, the indefinites which are, under certain conditions, soluble. The symbol I stands for *infinite indefinites*, that is, the indefinites that are greater than anything to which solutions can be found. And the symbol $1/I$ stands for *infinitesimal indefinites*, that is, the indefinites that are smaller than anything to which solutions can be found.

As soon as we agree to refer infinite numbers to the algebraic series, their seemingly unusual and contradictory properties become intelligible. We need several symbols to represent real indefinites, for, when they are being used in one and the same problem, they, as a rule, stand for different finite numbers. To employ an identical symbol for all real indefinites, would introduce considerable confusion into our problems and prevent us from solving them. Hence we are wont to write $x + 1 = y$, rather than $x + 1 = x$, although x may stand for entirely different numbers in various independent problems. Similar considerations apply to infinite and infinitesimal indefinites. Addition, subtraction, and other mathematical operations do modify them, but, since their solutions can not be found, *it makes no difference* whether we use one or more symbols for these various numbers. In other words, we customarily write $I/n = I$, not because I on both sides of the equation is one and the same, but because in both instances it stands for some infinite indefinite. We use the symbol I for all infinite indefinites, because it is convenient to do so, or because it is superfluous to use more than one symbol. But to assume that all infinite indefinites are *therefore* equal, or that mathematical operations do not modify them, or that an infinite number has as many terms as any of its parts, is the height of absurdity. Whereas the equations $n.I = I$ and $I/I = n$, in which I represents a member of the arithmetical series, are something that defies human reason, the equations $n.I = I$ and $I/I = n$, in which I stands for two different members of the algebraic series, are easily understood, for they mean that one of the I's is n times greater than the other.

Our concepts of real infinites, such as the spatial infinity or eternity (*sempiternitas* or *aeviternitas*) are, whether we know it or not, in close connection with, indeed depend upon, our mathematical notion of infinite numbers. It is, therefore, highly interesting to see what bearing the foregoing reflections can have upon our interpretation of nature. Having recognized the existence of infinite numbers as members of the arithmetical series, our fathers transferred the concept, by mere analogy, into the realm of actual entities. But the assumption, tempting as it may be, is not tenable, for, as soon as we attempt to give real infinites a positive meaning, there arise contradictions which never yet have been, nor probably could have been,

adequately accounted for. If we are to understand by infinity something negative, a kind of real endlessness, the analogy is not valid, for the simple reason that no negative entities, for all we know, can be ontological entities. Finally, infinity, in the sense derived from the algebraic series, can be applied no better to reality. There are no indefinite realities. Everything that is must be somewhere and at some time, that is, stand in definite spatial and temporal relations to everything else. It is absurd to believe, so far as I can see, in the existence of points of space or moments of time, located infinitely apart. The distance between two real objects certainly can not be equal to a half of the distance. Nor can the interval between two events be equal to a half or a third of the interval. All real distances and intervals are necessarily definite (though they may be relative to the observer), from which fact it seems to follow that all real magnitudes are finite. Human ways of measurement may often be inadequate to give us satisfactory answers to some of our queries. It is obvious that direct experience can solve no problems of infinity and eternity. So it remains for us to rely on reason. But, if we follow its guidance, I do not see how we can avoid the admission that, in all probability, we are living in the finite universe.

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BOOK REVIEWS

Six Theories of Mind. CHARLES W. MORRIS. Chicago: University of Chicago Press. 1932. vii + 337 pp.

Professor Morris's volume is a discussion of theories of mind from the standpoint of functionalism: mind equals symbolic functioning. Not six, but about thirty-six theories are discussed. These are classified, not always with perfect justification, under six heads: substance, process, relation, intentional act, substantive, and function. Beginning with primitive conceptions of mind, the discussion proceeds through classical Greek and modern theories to contemporary thought. Some of Professor Morris's discussions of contemporary thinkers were submitted before publication to the authors themselves: e.g., Russell, Strong, Lovejoy, Laird, Dewey. Comments by these authors are included as footnotes to the text, and two and one half pages of the text are given over to a brief re-statement by Russell of his analysis of mind. An extra effort to be fair to opposed views is made throughout.

The volume is preponderantly critical. Nearly five-sixths of it are devoted to pointing out the limitations of non-functional theories of mind, particularly those of dualism, idealism, intentionalism, and new and critical realism. No summary of this wealth of interesting

criticism is possible in a brief review. But it may be said that, to the reviewer at least, these critical portions seemed not only scholarly and fair, but, for the most part, sound and penetrating, if not always decisive.

Equal praise, I think, can not be given to the final sixth of the volume, which contains a positive exposition of Professor Morris's own theory of mind. This exposition, which is based largely on the writings of Professor Dewey, is admittedly incomplete, since a general theory of symbolism and its application to the nature of mind are reserved for a later volume. Perhaps it would be futile, not to say unfair, even to attempt to pass judgment on the theory in its present form. In what follows, I intend to take up several points which are peculiarly puzzling in the present exposition, but not to come to full critical grips with the central thesis of Professor Morris's doctrine.

The identification of mind with symbolic functioning (vii) is, I think, too narrow. Mind is more than its representational power. It has, for instance, an evaluative side. And any discussion of mind which pretends to be comprehensive must take account of this activity of estimating, as well as the activity of representing. Professor Morris is apparently interested wholly in epistemological questions, in the problems of givenness and objectivity and transcendence, not in the problems of desire and personality and spiritual growth. This is very well. But, then, the title of his book should have been, Six Theories of Mind as Cognitive, and some recognition should have been given the fact that there is more to mind than merely the activity of symbolizing the absent.

One is puzzled, in the second place, about the locus of mind. Statements such as the following occur: mind is the symbolic functioning of events that are not intrinsically mental (p. 276); mentality is the function of indicating other events (p. 296); meaningful events are mental events. Such statements leave the impression that if any event at all functions symbolically, as the sign on the highway, or the blackish gray of a storm cloud does, it possesses mentality, or mind. Such a view seems hardly superior to new realism, not to mention pan-psychism, but the point is that, despite its reiteration, it does not seem to be exactly what Morris means to say about the locus of mind. In one place, indeed, it seems to be simply denied (p. 261); whilst earlier in the volume (pp. 201, 158), statements are made which leave the impression that mentality is not so much a property of symbolizing events, as of subject-symbolizing-event-object. It is an emergent character of the total cognitive situation. In the meantime, one is further puzzled because one finds, in this professedly naturalistic account of mind, little or nothing said about what one supposes is the most natural view of the

locus of mind; viz., that mind is simply a complex characteristic, not of sign-posts or of subject-symbolizing-event-object, but of intelligent organisms.

One difficulty has to do with emergence. Emergence, although mentioned frequently, is nowhere defined, so one must suppose it means what it does for its most distinguished interpreters, Morgan and Alexander. The difficulty arises when Professor Morris defines physical objects as qualitied objects, and components of qualitied objects as physical: e.g., mentality as a component of a physical sign-post, or of a physical organism, or of whatever in nature it is a component of, is physical (p. 243). Such a definition, equating physical existence and all existence, seems to negate the whole point of the emergence doctrine, which, at least in its authoritative form, holds that the physical is merely one of several levels of existence, that there are other levels qualitatively above the physical, and that the idea of emergence at long last provides a key for understanding satisfactorily the mode of genesis of the so-called higher from the so-called lower. If all reality is simply physical, and if all that qualifies anything is merely a physical quality, there can be no genesis of higher out of lower, and the whole emergent hierarchy, as well as the point of emergence as a principle explaining the mode of origin of levels of novel quality, in short, emergence in its accepted sense, becomes meaningless.

There are a number of other difficulties. For instance, Professor Morris accepts "the definition of truth as 'processes of change so directed that they achieve an intended consummation'" (p. 310). But the statement in this sentence, quoted from Professor Dewey, no more accurately defines truth, I think, than it defines a successful battle-manoeuvre, a beautiful stage-production, or a skillful robbery. In general, in the sixth chapter, which, as I have said, contains Professor Morris's own theory of mind, there seems to me to be a rather complete lack of that fine critical independence which so markedly distinguishes the five preceding chapters. Professor Morris, I venture to say, simply does not see Professor Dewey's doctrines critically, I mean to say, philosophically.

The preceding remarks express a few random dissatisfactions that the reviewer has felt in reading over the present undeveloped exposition of Professor Morris's theory of mind. No doubt, the fuller exposition can cancel them all out. In the meantime, the critical portions of the present volume, its solid bulk, remain and constitute, on the whole, an interesting and brilliant piece of work, adequately showing that there is place for an approach to mind different from those discussed there.

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The Open World. HERMANN WEYL. New Haven: Yale University Press. 1932. Pp. 84.

This book consists of three lectures on the metaphysical implications of science, more specifically of mathematics and physics.

In contrast to the pragmatic and sceptical philosophies of science, Professor Weyl does speculative metaphysics in the grand manner. The title of the lectures, *The Open World,* conveys his view that our world points beyond itself to a transcendent realm. The essence of his philosophical position is given in the following statement, "The beginning of all philosophical thought is the realization that the perceptual world is but an image, a vision, a phenomenon of our consciousness; our consciousness does not directly grasp a transcendental real world as it appears." Idealism and realism are both one-sided. "In the transition from consciousness to reality the ego, the thou and the world rise into existence indissolubly connected and, as it were, at one stroke."

The world is revealed as an order of mathematical law. "But this ultimate foundation for the ratio governing the world, we can find only in God; it is one side of the Divine Being." Professor Weyl rejects the method of mysticism. "But in our knowledge of physical nature we have penetrated so far that we can obtain a vision of the flawless harmony which is in conformity with sublime reason. Here is neither suffering nor evil nor deficiency, but perfection only." In the mathematical construction of a field of possibilities which is open to infinity, and in the theoretical, symbolical construction of the world in physical science, mind is open toward the infinite. God, as the completed infinite, can be represented only in symbols.

In addition to the speculative metaphysics and theology the book contains illuminating comments on historical cosmologies, contemporary physics, and scientific methodology.

In the first lecture, "God and the Universe," the author opens his subject with a scholarly historical sketch of the influence of mathematics and cosmology upon theology. He comments with critical understanding upon the views of Pythagoras, Plato, Aristotle, Ptolemy, Dante, Copernicus and his successors. Of especial interest is the author's interpretation of Nicolaus of Cusa, in whom he finds an anticipation of modern ideas. The first lecture also includes an historical sketch of the concept of the ether from the Stoics down to the theory of relativity.

The second lecture, "Causality," is of great value to the student of the methodology of physics. The author does not think that the positivistic analysis of causality in terms of determination by law is wholly adequate; the concept of causality also expresses the meta-

physical notion of ground of determination. Following Leibniz he believes that the essence of causality is apprehended in the activity of the self. This lecture, however, is largely devoted to an analysis of the concept of law. Despite the author's adherence to what the positivists call the "School Philosophy," there is ample recognition of the operational analysis of physical concepts. Thus he asserts that the meaning of a physical quantity is bound to the method by which it is measured. "We do not find but enforce the general principles of natural knowledge." The implicit definition of the characteristics of objects is bound to these laws. "The proposition 'Under the same circumstances, the same results will hold,' is not something verifiable by experience, but a norm whose validity we enforce in building up our experience." Professor Weyl especially seeks loopholes in the doctrine of determinism in order to find a place for the freedom of the will. He is reluctant, however, to decide at this time the positive contribution of the quantum theory to this problem.

In the final lecture, "Infinity," the author relates the history of the opposition between continuity and atomism, he expounds the construction of the number system, and discusses the problems raised by the infinite in contemporary philosophy of mathematics.

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NOTES AND NEWS

We regret to announce that Flora I. MacKinnon, Associate Professor of Philosophy at Wellesley College, died on December 11 at Wellesley, Mass., after a short illness from pneumonia.

At the Eighth Annual Meeting of the American Catholic Philosophical Association, which will be held at the Sacred Heart Seminary, Detroit, December 28 and 29, the general subject will be "Current American and British Realism." At the afternoon sessions there will be Round Table Discussions in several divisions on the subjects of Epistemology, Philosophy of Nature, Philosophy of Mind, Ethics. The two morning sessions will be devoted to the reading of the following papers:

DECEMBER 28.

Present Scholastic Problems of Realism.....*Edward F. Talbot*
Realism and the New Physical Theories.....*Augustine Osgniach*
Psychological Aspects of Current Realism.....*John E. Burns*

DECEMBER 29.

The Essential Features of Critical Realism.....*John S. Middleton*
The Organic Realism of Whitehead.....*Joseph A. Schabert*
Current British Realism.....*William J. O'Meara*
Anti-Realistic Tendencies.....*Daniel C. O'Grady*

The Presidential Address will be delivered at the Annual Dinner on December 28 by James A. McWilliams.

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